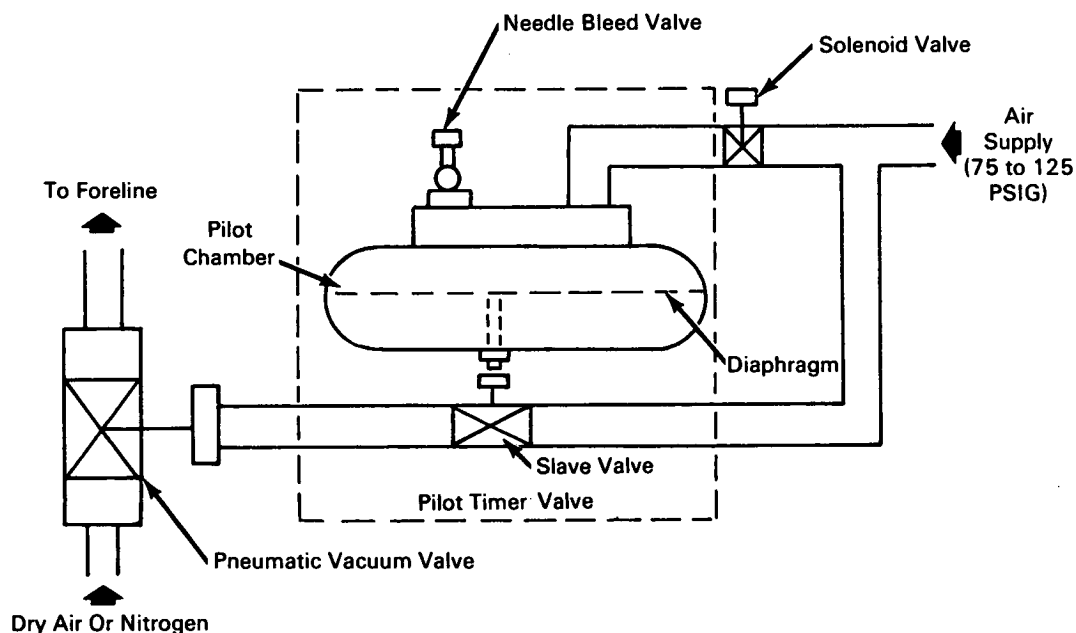


# NASA TECH BRIEF



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## Automatic Protective Vent Has Fail-Safe Feature



### The problem:

When a mechanical backing pump in a vacuum system is cut off for any reason, the vent valve opens before the larger pneumatic foreline valve is able to seal, even though the two valves are energized at the same time. Under this condition, a burst of air will enter the vacuum chamber and diffusion pump.

### The solution:

A delayed vent valve system that allows the foreline valve to seal before the pump vent opens. The system is designed to be fail-safe and operate even though there is a loss of electrical power.

### How it's done:

The removal or loss of power to the solenoid operated control valve shuts off the supply of service air to the pilot timer valve. The pressurized air in the pilot chamber bleeds off through an adjustable needle valve, allowing the spring loaded diaphragm to actuate a slave valve under the pilot chamber. This slave valve opens to admit service air to the normally closed pneumatic vacuum valve, thus providing a delayed venting of the mechanical pump foreline. The time delay is controlled by the needle valve on the pilot chamber.

(continued overleaf)

**Note:**

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer  
Langley Research Center  
Langley Station  
Hampton, Virginia 23365  
Reference: B66-10369

**Patent status:**

No patent action is contemplated by NASA.

Source: C. E. Dameron  
(Langley-218)